monoliths of Egypt have been hewn, such as Cleopatra's Needle' the obelisk of Luxor, and the columns which adorn the Piazza of Venice. This foundation rock formed part of a continental area down to the Carboniferous period, when it was submerged, and a great sandstone formation was spread over it known as "the Nubian sandstone." After another interval of time the sandstone itself was overspread by limestone deposits of Cretaceous and Tertiary age, deposited over the floor of the ancient sea, and down to the close of the Eocene period the waters of the sea overspread the greater portions of Asia Minor, Palestine, and the adjoining districts of the Asiatic and African continents. The first appearance of Palestine and the adjoining districts as a land surface dates from the succeeding Miocene period, when the bed of the sea was upraised into dry land, and at the same period a great fissure corresponding with the line of the Jordan valley was produced. Along this fissure, which has been traced from the Lebanon southwards towards the Gulf of Akaba—the strata on the eastern (or Moabite) side have been relatively elevated: those on the western relatively depressed;—so that the strata on the opposite sides of the Jordan valley and the Dead Sea do not correspond with each other. This great fissure is the key to the physical formation of the whole region, because it gave origin to a river which once flowed down from the mountains of Lebanon—southwards through the Gorge of Arabah (discovered by Burkhardt)—into the Red Sea in a remarkably straight line running north and south for a distance of over 250 miles. This is now the Jordan. The depression of the valley continuing through the succeeding Pliocene epoch, the district of the Ghor and the Jordan valley was conveyed into a lake, which Prof. Hull considered ultimately extended from the southern end of the Dead Sea, northwards nearly to the Lake Merom, and included the Sea of Galilee. This lake would then have had a length of 160 miles and an average breadth of ten miles. During "the Pluvial period," which succeeded "the Glacial," the waters probably reached their maximum elevation, and continued to flow southwards through the Gorge of Arabah and the Gulf of Akaba into the Red Sea; but from the increasing dryness of the climate they gradually decreased, and the surface of the lake became contracted, and ultimately reduced to its existing limits. During this lowering of the surface, the remarkable terraces noticed by most travellers were formed. Dr. Tristram has taken the barometric level of several of these above the Dead Sea. They range up to 750 feet, and even higher. They appear to be undoubtedly old lake margins, and indicate the successive levels at which the lake stood. The 750-foot terrace very closely corresponds to the summit-level of the Gorge of Arabah. When the waters were reduced so low as not to pass through the Gorge of Arabah, they became brackish, and ultimately salt—the salinity increasing as the area became diminished. All lakes not having an outlet become saline; and the contrast of the waters of the Sea of Galilee and those of the Dead Sea form a striking illustration of the law just stated. The saline ingredients in the surface waters of the Dead Sea are 24·57 lbs. in 100 lbs. of the water, while that of the Atlantic only contains 6 lbs. in the same quantity. The Dead Sea water is therefore over four times as strongly impregnated with salts as that of the ocean, and in the deeper waters the salinity amounts to saturation, as saline deposits are forming over the floor of the Dead Sea. This remarkable inland sea had assumed somewhat of its present contracted dimensions, and was known as "the Salt Sea" as far back as the time of the Patriarch Abraham. Near its borders stood the doomed cities of Sodom and Gomorrah—not beneath its waters, as was often supposed—but near its upper margin. With the call of Abraham the political and religious history of Palestine begins, and the narrative of the physical historian ends

SCIENTIFIC SERIALS

American Journal of Science, March.—The selective absorption of solar energy, by S. P. Langley.—New locality of the green turquois known as chalcuite, and on the identity of turquois with the callais or callaina of Pliny, by W. P. Blake.—On portions of the skeleton of a whale from gravel on the line of the Canada Pacific Railway near Smith Falls, Ontario, by J. W. Dawson.—The cobwebs of Uloborus, by J. H. Emerton.—Glacial drift in the Upper Missouri River region, by C. A. White.—Late observations concerning the molluscan fauna and the geographical extent of the Laramie group, by the same.—The Sphingidæ of North America, by A. R. Grote.—"Rotational coefficients" of various metals, by E. H. Hall.—Recent exploration of the volcanic phenomena of the Hawaiian islands, by C. E. Dutton.

Journal of the Russian Chemical and Physical Society, vol. xiv. fasc. 9.—On several ethylenic hydrocarbons, and on their action on water, by M. A. Eltekoff. Of the compounds of the series $C_nH_{2n}O$, the oxides are the least known, and it still remains in doubt as to those described by MM. Bauer, Würtz, Jekyll, and Clermont being true oxides and not ketones; M. Eltekoff studied, therefore, the action on water of seven compounds of this series. He arrives at the conclusion that the characteristic features of oxides do not disappear, as seemed formerly to be the case, in more compound oxides containing even as much as six equivalents of carbon. Their capacity of entering in direct compounds with water diminishes, however, in proportion as the molecule becomes more complicated.—On the oxidation of sulphur used for covering the vineyards, by M. A. Bazaroff.—On the evaporation of liquids, by M. Sreznewsky. Evaporation of benzol, ether, ethyl-alcohol, chloroform, and sulphur of carbon at different temperatures. The paper will be continued.—On the critical temperature and pressure of water, by M. O. Strauss. The average of a series of observations gives for the critical temperature of water 370°, with a probable error of 5°. The critical pressure would be 195·5 atmospheres.—Historical sketch of the work accomplished by the Physical Society during its ten years' existence, by M. N. Hesehus.—On the temperature of the absolute vaporisation of liquids, by M. Nadejdin.—On the spheroidal state of liquids, by M. D. Diakonoff.—Minutes of proceedings.

Rivista Scientifico-Industriale e Giornale del Naturalista, January 15.—The glossograph of S. Gentilli.—Influence of ozone in agriculture, by S. Zinno.—The radiometer and school experiments, by C. Rovelli.—Fossil elephants in the district of Parma.—Simple holohedral forms of the rhombohedral system, by M. de Lupo.

Reale Istituto Lombardo di Scienze e Lettere. Rendiconti, vol. xvi. fasc. i.—Meteorological *résumé* of the year 1882, calculated on observations made at the Royal Observatory of Brera, by E. Pini.—The frost of 1882 considered in its agrarian and meteoric aspect, by E. Ferrario.—Results of observations on the amplitude of diurnal oscillation of the declination-needle made during 1882 at Brera Observatory, by G. Schiaparelli.—On the action of metallic iodide on leucine and other like substances, by G. Körner and E. Menozzi.

Fasc. ii.—Property of a class of functions with more variables than are presented in dynamics in the case of permanent motion, by C. Formenti.—On some plane involutions, by E. Bertini.—Generalisation of a theorem on the analytical representation of substitutions, by A. Grandi.

Schriften der Physicalisch-Ökonomischen Gesellschaft zu Königsberg. 1880, first part; 1881, first and second parts.—Geological investigation of the North German level country, especially East and West Prussia, in the years 1878–80, by A. Jentzsch.—Contributions to a knowledge of the Silurian Cephalopoda found in the East and West Prussian diluvial formations, by H. Schröder.—Rugous corals in the same formation, by G. Meyer.—The scales of our fishes, by B. Benecke.—On some diluvial and alluvial diatom-layers of North Germany, by P. T. Cleve and A. Jentzsch.—The underground portion of the North German level country, by A. Jentzsch.

Verhandlungen der Naturhistorischen Vereines der Preussischen Rheinlande und Westfalens, 1882 (first half).—Further observations on fertilisation of flowers by insects, by H. Müller.—On the various systems of measurement of electric and magnetic quantities, by R. Clausius.—The lower Devonian strata of Olkenbach, by O. Follmann.

SOCIETIES AND ACADEMIES

London

Royal Society, March 8.—"Notes on the Absorption of Ultra-Violet Rays by various Substances," by Professors Liveing and Dewar.

These notes contain some records of ultra-violet absorptions in addition to those which have been examined by Soret, Hartley, M. de Chardonnet, and other investigators. For these observations the spark of an induction coil, with Leyden jar, between iron electrodes, was generally used as the source of light. The lines of iron are so multitudinous, and so closely set in a large part of the ultra-violet region of the spectrum, that they form almost a continuous spectrum, at the same time there are amongst them a sufficient number of breaks and conspicuous lines to serve as points of reference. The optical train used was wholly of quartz, and the spectra were all photographed.

Chlorine in small quantity shows a single absorption band extending from about N (3580) to T (3020). As the quantity of chlorine is increased this band widens, expanding on both sides, but rather more rapidly on the less refrangible side. Different quantities of chlorine produced absorption from about H (3968) to wave-length 2755, from wave-length 4415 to 2665, and from wave-length 4650 to 2630. With the greatest quantity of chlorine tried, the absorption did not extend above wave-length 2550.

Bromine vapour in small quantity absorbs light up to about L (3820), and is quite transparent above that. With larger quantity the absorption increases, gradually extending with increase of bromine vapour from L to P (3360); and at the same time there is a gradually increasing general absorption at the most refrangible end of the spectrum beginning at about wave-length 2500; so that the denser bromine vapour is transparent for a band between wave-length 2500 and 3350.

Liquid bromine in very thin film between two quartz plates is transparent for a band between wave-length about 3650 and 3400, shading away on both sides, so that below M on one side and above P on the other the absorption seems complete. The transparency of the liquid film ends on the more refrangible side just where that of the vapour begins.

Iodine vapour tolerably dense cuts off all within the range of our photographs below wave-length 4300, and its absorption gradually diminishes from that point up to about wave-length 4080; from that point it is transparent. Denser vapour produces complete absorption up to 4080 and partial absorption above that point.

Comparing the absorptions of the three haloid elements, the principal band shifts towards the less refrangible side with increasing atomic weight, as Lecoq de Boisbaudran has noticed in the case of lines corresponding to one another in the spectra of groups of similar metals.

Iodine dissolved in carbon disulphide is transparent for a band between G and H, cutting off all above and below. It is not possible to tell how much of the light above M (3727) is absorbed by iodine in such a solution, inasmuch as carbon disulphide is opaque for rays more refrangible than M.

Iodine dissolved in carbon tetrachloride when the solution is weak shows only the absorption due to the solvent, described below. More iodine increases the absorption until it is complete above P (3360), with shading edge as far down as about wave-length 3400.

Sulphurous acid gas produces an absorption band which is very marked between R (3179) and wave-length 2630, and a fainter absorption extending on the less refrangible side to O (3440), and on the other side to the end of the range photographed, wave-length 2300.

Sulphuretted hydrogen produces complete absorption above wave-length 2580. Below that a partial general absorption.

Vapour of carbon disulphide in very small quantity produces an absorption band extending from P to T, shading away at each end; no absorption in the higher region. With more vapour the absorption band widens, extending from about wave-length 3400 to 3000, and a second absorption occurs beginning at about wave-length 2580, and extending to the end of the range photographed.

Carbon tetrachloride liquid produces an absorption band with a maximum about R, extending, but with decreasing intensity, up to Q (3285) on one side, and to *s* (3045) on the other. In the higher region there is a second absorption sensible about wave-length 2600, and increasing in intensity up to about wave-length 2580, beyond which point it is complete.

Chlorine peroxide gives a succession of nine shaded bands, at nearly equal intervals, between M and S, with faint indications of others beyond. In the highest region this gas seems quite transparent.

A slice of chrome-alum a quarter of an inch thick is transparent between wave-lengths 3270 and 2830; its absorption gradually increases on both sides of those limits, but rather more rapidly on the more refrangible side than on the other, and becomes complete below about wave-length 3360 and above wave-length 2730.

A very thin plate of mica shows absorption beginning about S (3100), rapidly increasing above U (2947), and complete above wave-length 2840.

A thin film of silver precipitated chemically on a plate of quartz transmits well a band of light between wave-length about 3350 and 3070, but is quite opaque beyond those limits on both sides.[1]

A thin film of gold similarly precipitated merely produces a slight general absorption all along the spectrum.

The difference between the limits of transparency of Iceland spar for the ordinary and extraordinary rays, inferred from theory, was found to be very small, and hardly to be detected without using a considerable thickness, three inches or more, of the spar.

The authors had expected to be able to apply the well-known photometric method by means of polarised light to the comparison of intensities of ultra violet rays. Ordinary Nicol's prisms are not applicable to ultra-violet rays on account of the opacity of the Canada balsam, with which they are cemented, so Foucault's prisms were used. Upon taking photographs of the spectrum of the iron spark through this pair of prisms at various inclinations between the planes of polarisation of the two prisms, it was found that for the whole range between the position of parallelism and the inclination of 80° there was no sensible difference of effect upon the photographic plate, though the length of exposure was in all cases the same. For inclinations between 80° and 90° there was a sensible and increasing diminution in the photographic effect as the planes of polarisation of the polariser and analyser were more nearly at right angles to one another. It seems to follow from this that the full photographic effect on the dry gelatine plates used ensues when the intensity of the light reaches a certain limit, but that for intensities of light beyond that limit there is no sensible increase in the effect until the stage of solarisation is reached.

Chemical Society, March 15.—Dr. Gilbert, president, in the chair.—Dr. Gilbert will resign the presidential chair at the end of the session.—The Council have proposed Dr. W. H. Perkin to fill the vacancy, and Mr. J. Millar Thomson to be Secretary.—The following papers were read:—On some condensation-products of aldehydes with aceto-acetic ether and with substituted aceto-acetic ethers, by F. E. Matthews. The author has studied the following reactions: condensations of aceto-acetic ether with isobutylic aldehyde, valeric aldehyde, chloral furfurol, acrolein; of benzoic aldehyde with aceto-diethylacetic ether, aceto-dichloracetic ether, and aceto-benzilidene-acetic ether, and of benzoic aldehyde with aceto-mono-ethylacetic either.—Contribution to the chemistry of "Fairy Rings," by Sir J. B. Lawes, Dr. Gilbert, and Mr. Warington. The authors have analysed samples of the soil inside the ring, on the ring, and outside the ring. The soil inside is much poorer in organic carbon and nitrogen than the soil outside the ring; the soil at the ring itself is intermediate in character as to carbon and nitrogen, but contains a larger quantity of nitrates. The fairy ring fungi seem to derive and assimilate nitrogen from the soil; this nitrogen is eventually deposited as manure at the ring, and becomes available to the associated herbage, which thereby acquires the characteristic dark-green colour.—On lines of no chemical change, by Dr. Mills and Mr. D. Mackey. The authors have investigated the strength at which sulphuric acid ceases to attack zinc at certain temperatures.—On homologous spectra, by W. N. Hartley. The author has photographed and mapped the spectra of various elements belonging to the same homologous series, *e.g.* magnesium, zinc and cadmium, calcium, strontium and barium, &c., especially with a view to finding out whether the striking similarity in such spectra was due to harmonic vibrations of a common fundamental vibration. The author concludes that the data contained in the paper support the view that elements whose atomic weights differ by a constant quantity, and whose chemical character is similar, are truly homologous, or in other words, are the same kind of matter in different states of condensation.

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[1] Cornu ("Spectre Normal du Soleil," p. 23, *note*) mentions that such films of silver are transparent for rays about $\lambda = 270$, which is a good deal too high. Chardonnet (*Comptes Rendus*, February, 1883) states that the band extends from O to S. W. A. Miller (*Phil. Trans.* 1863) noticed that a silver reflector failed to reflect a band in the ultra-violet.

Linnean Society, March 1.—Sir John Lubbock, Bart., president, in the chair.—The following gentlemen were elected Fellows of the Society:—W. B. Barrett, L. J. K. Brace, J. B. Bridgman, W. O. Chambers, W. E. Clarke, W. Godden, F. H. H. Guillemard, J. C. Havers, T. M. Hocken, C. H. Middleton Wake, James Stirling, and Rev. P. W. Wyatt.—Two pieces of North American yellow pine were exhibited for Mr. R. M. Middleton, which displayed on their surface a great number of depressions like fine shot holes. These were doubtfully supposed to be produced by insect depredations.—Mr. W. T. Thiselton Dyer called attention to and made remarks on the dried leaves and rind of the fruit of oranges from the Bahamas, partially destroyed by the *Mytilaspis citricola*, Packard.—Mr. R. F. Towndrow showed examples of a new variety of *Rosa stytosa*, obtained at Madresfield, near Malvern, by Mr. A. D. Melin. This variety is evergreen, and its fruits ripen in the second year.—Mr. Alfred W. Bennett read a paper on the constancy of insects in their visits to flowers.—Then followed a communication on the methodic habits of insects when visiting flowers, by Mr. R. M. Christy, see notice (p. 498).—The Secretary, Mr. G J. Romanes, read some observations on living Echinodermata. He stated that star-fish possess a sense of smell which is not localised in any particular organs, such as the ocelli, but is distributed over the whole of the ventral surface. The function of the Pedicellariæ was shown by some further experiments, corroborative of those already published by him in the *Philosophical Transactions*, to be that of seizing upon and arresting the movements of fronds of seaweed in order to give the pedicels time to establish their adhesions. It was also shown that the righting movements of echinus, when inverted on its aboral pole (which are performed by means of the pedicels) are due to central coordination proceeding in part from the pentagonal nerve-ring surrounding the mouth, and in part from central nerve-matter distributed along the course of the radial nerve-trunks. One of the experiments whereby the fact of such central coordination (depending on a sense of gravity) was proved consisted in rotating an inverted echinus upon a wheel moving in a vertical plane. It was found that whatever phase in the righting manœuvre the echinus might have attained at the moment when the rotation commenced was maintained so long as the rotation continued, but the manœuvre was resumed so soon as the rotation was allowed to cease. The paper concluded with an account of the effects of the various nerve poisons on the Echinodermata.—There followed in abstract the 17th part of the Rev. R. Boog Watson's memoir on the mollusca of the *Challenger* expedition; therein he deals with the family Pyramidellidæ, describing twenty-three new species of the genus *Eulima*, and one of the genus *Stylifer*.

Geologists' Association, March 2.—Mr. W. F. Stanley read a paper upon the possible causes of the elevation and subsidence of the earth's surface. In this he offered an hypothesis that both the rising and sinking of land was entirely due directly or indirectly to the action of our great common motor, the sun. But most particularly for the greatest effects to the elevation of aqueous vapour, and to its after deposition as snow about the poles of the earth. The deposition of snow was assumed at the present time to reach a considerable altitude at the south pole, and in this position by its gravity to react as a pressure upon the interior mass of the earth, which was assumed to be in a highly heated viscous or semi-liquid state, and to be surrounded by a somewhat rigid crust of 200 miles or so in thickness. The crust was assumed to offer a certain amount of resistance to internal and external pressures, beyond which it was deflectable upon or from the viscous interior. The pressures from continued accumulation of snow at the poles acting as an hydraulic pressure upon the interior mass were assumed to be distributed in such a manner as was evident by elevation of land in volcanic and plutonic action, so that the earth could remain approximately under the conditions present, a symmetrical spheroid whose outward figure would constantly represent a natural resultant of the action of gravitation upon all its parts, and of the tangential force of such parts in revolution. It was argued that the stability of the land-surface was entirely due to *permanent elevation* by volcanic and plutonic action, and that if this did not exist the effects of atmospheric denudation would reduce the land surface within moderate geological time to a nearly level swampy plane. It was further discussed that if the interior of the earth is metallic, which has been reasonably inferred from its high specific gravity (about 5·6), then it would consist of a heat-conducting material, so that, beyond the non-conducting coating, which we term the crust, a certain degree of heat would be reached which might henceforth remain uniform throughout the interior mass. The crust would therefore be that portion of the exterior which was oxidised into a non-conducting coating in which the interior heated mass would conserve its heat with little loss. It was further argued that if the interior were a *viscous* mass the reaction of hydraulic pressure upon it, as from great accumulation of ice at either pole, would be made most evident about the most deflectable parts of the crust, so that the central mass might remain static, and if this was assumed by the presence of enormous pressure to form a practically incompressible semi-liquid, it would in this state possess enormous rigidity. Mr. Stanley further discussed the conditions of continuity of volcanic action throughout all time that the earth has existed as a cooling globe with a solid crust accumulating ice at either of its poles, and that the periods of greatest glaciation at either pole would be the periods of greatest volcanic eruption and elevation. Dr. Croll's theory of displacement of the earth's centre by polar glaciation was shown not entirely to coincide with observation, in that the coast of Greenland was sinking, and the coast of Norway, in the same latitude, was rising whereas by this theory of displacement of the earth's centre, the present accumulation of ice at the south pole should cause both of these parts to be rising equally. Mr. Stanley held that the cause of the coast of Greenland sinking was the weight of the present accumulation of ice upon that continent, which represented on a small scale a polar pressure system such as he had discussed.

Royal Horticultural Society, March 13.—Sir J. D. Hooker, K.C.S.I., in the chair.—*Potato-disease*: Dr. Masters read a portion of a paper on this subject forwarded to him by Mr. A. Stephen Wilson, and having especial reference to the "sclerotia" which Mr. Wilson has discovered in nearly all the organs of the adult plant, as well as in the seedlings and tubers. The sclerotia are supposed to germinate and lie in a state of incubation in the haulm. Ultimately they give rise to the conidial threads. The conidia form, according to circumstances, either (1) zoospores, (2) plasm granules, or (3) secondary conidia. These are succeeded by oospores and a non-parasitic mycelium, from which latter, as it creeps through the soil, are thrown out "floats" and specks of the seminal plasm. The seed-tuber comes into contact with the plasm in the soil, which is absorbed and becomes developed in the shape of sclerotia, and thus the life-cycle is completed. From the tuber or seed to the conidia is the parasitic arc. From the conidia to the tuber is the non-parasitic arc. The author illustrated his position by what happens in the case of cereals, wherein the plasm, say, of smut or rust, is absorbed by the cells of the scutellum or cotyledon, passes through a period of gestation and then germinates. Mr. G. Murray observed that a microscopical examination did not clearly reveal any organic connection between the sclerotia and the peronospora mycelium, and thought that possibly they might prove to be glandular bodies of some kind, and belonging to the potato itself. Moreover they could not be true sclerotia in the fungoid sense, as the latter are a compact mycelium.—*Retinospora pisifera* and *R. plumosa*: Mr. Noble sent a specimen exhibiting sprays of both of these supposed species on the same plant. Dr. Masters remarked that the latter is the young form, while the former is the adult, and that a microscopical examination showed a correspondingly different distribution of the stomata, being more numerous in *R. plumosa*.—*Juniperus Chinensis*: He also sent a male spray taken from a female plant; the sexes in this species being normally quite distinct.—*Garrya elliptica grafted on Aucuba Japonica*: Mr. Noble forwarded a specimen showing the stock and the graft united. Mr. Henslow observed that this was an instance where physiological affinity corroborated the morphological; in that while Endlicher had placed Garrya between the hop and the plane, Bentham and Hooker assigned its position in the "Gen. Plantarum" next to Aucuba; but the discovery of its power of grafting on Aucuba was purely accidental, having been made by a gardener in Mr. Veitch's nurseries.—*Carica*, hybrid: Mr. Green, gardener to Sir G. Macleay, sent ripe fruits and foliage of a plant grown from seed furnished by M. Van Volxem of Brussels. It is a hybrid of the second generation, the first being raised from *C. erythrocarpa*, impregnated with the pollen of *C. cundinamarcensis* (from Colombia). From the fruit of this cross seedlings were raised, which were impregnated with pollen from the last named species, or from the hybrid itself. Some of the fruits supplied by Mr. Green contained apparently good seed. Mr. Henslow has tried the effect of the foliage on meat, that of the "Papaw," *C. papaya*, having the well known property of rendering it tender. He wrapped a piece of steak in a leaf for twenty-four hours, and it was quite effectual in softening it, and when cooked was pronounced excellent, though some thought there was a somewhat peculiar flavour as compared with a similar piece not wrapped up.

MANCHESTER

Literary and Philosophical Society, January 9.—H. E. Roscoe, F.R.S., &c., president, in the chair.—Dr. Joule said that he had, in December, 1882, made a fresh determination of the freezing-point in a sensitive thermometer constructed thirty-nine years ago. During that time the point had risen about 1° Fahrenheit, and although now rising very slowly, was not even yet quite stationary, having risen 1/40 of a degree Fahrenheit since November, 1879.

January 23.—J. P. Joule, F.R.S., vice-president, in the chair.—Remarks on the simultaneous variations of the barometer recorded by the late John Allan Broun, by Prof. Balfour Stewart, F.R.S.—A paper was read entitled "Jeremiah Horrox and William Crabtree, the Observers of the Transit of Venus in 1639," by Mr. John E. Bailey, F.S.A.

February 6.—Prof. Balfour Stewart, F.R.S., in the chair.—Note on the vapours of incandescent solids, by Henry Wilde.—Remarks on Prof. Osborne Reynolds' paper on isochronous vibrations, by Robert Rawson, Hon. Member. Assoc. I.N.A., Mem. of the London Mathematical Society.

February 20.—H. E. Roscoe, F.R.S., &c., president, in the chair.—Mr. R. D. Darbishire, F.G.S., read a note upon the Mammoth Cave, by Mr. G. Darbishire.

BERLIN

Physiological Society, February 23.—Prof. Du Bois Reymond in the chair.—Prof. Lucae, induced by the perception of a low noise when, in the open country, a strong wind blew against his ear, has long experimentally studied this phenomenon, investigating sounds and noises which arise on blowing into the external auditory meatus. He observed in normal ears which were closed with a sound tympanic membrane a moderately high noise, the pitch of which could not exactly be determined. When the tympanic membrane was stretched, the noise was somewhat higher and piping; when, on the other hand, the tympanic membrane was broken through or was absent, so that in the experiment the large air-space formed by the middle ear with the large cellular air-spaces beyond was blown into, he then heard a very deep noise. This great difference between the proper tone of the external auditory meatus and that of the large irregularly-formed air-space behind the membrane Prof. Lucae has verified both in all suitable patients and in dead bodies. An estimate of the relation of resonauce of the ear cavities was obtained when, upon a spherical resonator which gives the tone $c_{\prime}$ on blowing, a short open cylinder was placed, which, blown into separately, gives the tone $c_{\prime\prime}$; when this combination was jointly blown into, the considerably deeper tone H was heard. When, however, between sphere and cylinder, a stretched membrane of caoutchouc was introduced, and the system blown into, there was heard again a higher tone, $f_{\prime}$. The influence here exercised by the degree of tension of the membrane could not be determined. To bring this schema of the air-spaces of the ear still nearer to the natural conditions, dry sponge was placed in the spherical resonator, the cavities of this material corresponding to the bone cells communicating with the middle ear; the pitch of the tone on blowing was not thereby much altered. The determination of the proper tone of the tympanum and the influence of these conditions on audition are further engaging the author's attention.—Dr. Pohl Pincus had explained at a previous meeting of the Society that in the non-vascular frog heart two groups of muscular fibres with different action must be distinguished. The one class of fibres surrounds the fissures of the heart-wall, which perform the function of the vessels and admit the nutritive liquid to the tissue (vessel-muscles); the others, by their regular contractions and dilatations, act in the way of moving the blood (proper heart-muscles). The contraction of the first kind of muscles closes the fissures and produces paleness of the heart-wall, and their dilatation opens the fissures, lets the blood penetrate into the substance of the heart, and reddens the heart-wall; while the action of the second group of muscles produces systole and diastole of the heart. Now the actions of these two kinds of muscles—the heart-vessel muscles and the proper heart-muscles—are not simultaneous and similar under the influence of local stimuli, removal of the brain, section of the spinal cord in different places, and poisons; sometimes the heart-walls were observed to be pale in diastole and deep red in systole, and there were various other local differences of behaviour. This led the author to seek also an anatomical difference of the two groups of muscles, and he found one such on microscopical examination, for the proper heart-muscle fibres were cross-striped throughout and had long cell nuclei, whereas in the others the cross-striping did not comprise the whole width of fibres, and the nuclei were oval. With this anatomical difference the different mode of reaction of the two kinds of muscles and their different function is intelligible.

VIENNA

Imperial Academy of Sciences, January 4.—The following papers were read:—G. Haberlandt, on the physiological anatomy of milk-tubes.—T. Wiesner, on the entering of the winter-buds of creeping blackberry-shoots into the soil, and on the mechanical cause of this process.—F. Rathay and B. Haas, on Phallus and Caprinus.—A. v. Obermayer, on diffusion of gases (third paper).

January 11.—F. Enrich, on the action of bile acids on albumen and peptones, and on their antiseptic effects.—T. Haubner, on the logarithmic potential of an uninsulated elliptic plate.—A. Lieben and S. Zeisel, on the products of condensation of propionaldehyde and its derivatives.—F. Anton, determination of the orbit of the Cassandra planet (114).—T. Ehrmann, on the formation of adipose tissue by the fat-organs, named winter-sleep-glands.

January 18.—C. Rabl, contribution to the history of development of Prosobranchiata.—F. Brauer, systematic studies based on the Diptera-larvæ, with a description of new species (third part).—R. Andreasch, on the oxidation of bases obtained by the action of halogen-compounds on thio-urea.—T. Freydl, note on the dry distillation of tartaric and citric acid with an excess of lime.—C. Pelz, on the determination of the outlines of warped screw-planes.—G. Goldschmidt, on the products of decomposition of the anhydrides of salicylic acid by distillation.—F. N. Dafert, on amylbenzol.

February 1.—W. Biedermann, contributions to general nerve and muscle physiology (tenth communication); to the knowledge of secondary contraction.—A. Belohoubek, on crystallised potassium hydroxides.—T. Blaas, contributions to the knowledge of natural water containing double sulphates.—T. Hepperger, determination of the orbit of Schmidt's nebulæ.—M. Kretschy, on the oxidation of kynurine and kinurenic acid.

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